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10/080,915	02/22/2002	Randy Harris	291958173US1	7799

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EXAMINER

WILKINS III, HARRY D

ART UNIT	PAPER NUMBER
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1742

DATE MAILED: 03/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. <u>10/080,915</u>	Applicant(s) HARRIS ET AL.	
	Examiner Harry D Wilkins, III	Art Unit 1742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-32 is/are rejected.
- 7) ☒ Claim(s) 13 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>10/17/03, 04/16/04</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Allowable Subject Matter

1. Prosecution on the merits of this application is reopened on claims 1-32 considered unpatentable for the reasons indicated below:

In view of newly found references Thompson et al (US 5,168,886) and Curtis et al (US 6,264,752).

Specification

2. The disclosure is objected to because of the following informalities: on page 18, line 3, please provide the serial number of the referenced application.

Appropriate correction is required.

Claim Objections

3. Claim 13 is objected to because of the following informalities: in line 3, "first" should be deleted. Appropriate correction is required.

Double Patenting

4. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

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5. Claims 1, 12-15, 21, 25, 26, 28 and 31 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 2, 3, 6, 12 and 14 of copending Application No. 10/080,914. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of the '914 application fully encompass the present claims. Though the claims of the '914 application do not describe the types of processing stations contained therein, one of ordinary skill in the art would have immediately envisaged adding an application station, a removing station or a thermal processing station to the apparatus because these are all conventional semiconductor wafer processing stations for performing conventional processing steps on the wafers.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1, 8 and 14-15 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Thompson et al (US 5,168,886).

Thompson et al anticipate the invention as claimed. Thompson et al teach (see figure 1, col. 2, lines 12-42 and col. 3, lines 25-28) an apparatus for processing semiconductor wafers that includes a plurality of processing stations 51 that are manually accessible, at least one of the processing stations being adapted to apply a material to the wafer, an input/output station 53 to support at least one wafer for automatic transfer to and from the processing stations and an automatic robotic transfer device 52 positioned near the input/output station being capable of automatically moving the wafers between the input/output station and the processing stations. The robotic arm released the wafers for processing at the stations.

Regarding claim 8, Thompson et al teach (see figures 4-5 and related description at col. 3, lines 8-41) that the station includes a vessel (not shown) configured to store a liquid, a support configured to carry the wafer and a fluid manifold being coupled to the vessel and having a plurality of fluid jets directed toward the support to spray the wafer with the fluid.

Regarding claim 14, all of the processing stations of Thompson et al are manually accessible from a single side of the apparatus.

Regarding claim 15, the apparatus of Thompson et al includes a vessel 51 for processing the wafers and a support 50 configured to hold the wafer, the support being movable between two positions in the apparatus. The wafers are automatically loaded into the support or can be manually loaded at any location. The support is capable of stopping its motion at any location.

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8. Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Curtis et al (US 6,264,752).

Curtis et al teach (see figures 11 and 12 and description thereof beginning at col. 10, line 10, an apparatus for processing microelectronic workpieces comprising a plurality of processing stations 65, an input/output station 607 configured to support at least one workpiece for automatic transfer to and from the processing stations, and a transfer device (610/615 in figure 11, or 625 in figure 12) positioned proximate to the input/out station and the processing stations to transfer the workpieces between the input/output station and the processing stations. At col. 10, lines 18-24, Curtis et al clearly disclose at least one of the stations includes an application station configured to apply a material to the workpiece. At col. 10, lines 10-12, Curtis et al state that the apparatus of figures 11 and 12 "may employ one or more processing stations including the reactor constructions described above". One of these reactor constructions is shown in Figures 2-8 and the description thereof starting at col. 6, line 9. IN col. 8, lines 17-67 (particularly lines 44-49), Curtis et al disclose that this reactor construction is such that workpieces can be inserted and extracted from the reactor manually or by an automatic robot. Furthermore, from the description at col. 8, lines 50-67, it is clear that when the workpiece is transferred to the reactor via robot, the robot releases the workpiece for processing in the reactor. Based on these disclosures of Curtis et al, if all of the processing stations 605 of figures 11 and 12 included the reactor construction shown in figures 2-8, then all of the processing stations would be manually accessible to a user to manually load workpieces for processing.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 2-5, 7, 9-11, 18-24 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thompson et al (US 5,168,886) in view of Applicant's admission of prior art.

The teachings of Thompson et al are described above (all references to paragraph numbers in the present application come from the PGPub of this application, 2003/0159921).

Thompson et al teach (see col. 2, lines 34-42) that the processing stations are conventional in the art for processing the semiconductor wafers.

Hence, Thompson et al does not teach the details of the conventional processing stations.

However, Applicant admits as prior art (see paragraphs 81, 89, 96, 105, 110, 121 and 134) that certain aspects of the processing stations were known in the prior art from various disclosed references. This subject matter corresponds to the inventions shown in Figures 9, 12-14, 16 and 18. Each of these conventional processing stations corresponds to claims 2-5, 7 and 9-11.

Therefore, it would have been obvious to one of ordinary skill in the art to have adapted the apparatus of Thompson et al to use the conventional processing stations

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disclosed by Applicant because the conventional processing stations allow any desirable process to be carried out upon the semiconductor wafers, such as electroplating, removal of material, metrology (testing of certain properties) and thermal processing.

Regarding claim 18, Thompson et al teach (as above) the apparatus including a spray station as claimed. Thompson et al do not teach adding a electrodeposition station as claimed. However, Applicant admits that such a electrodeposition station was known in the prior art (see paragraph 105). Therefore, it would have been obvious to one of ordinary skill in the art to have adapted the apparatus of Thompson et al to use the conventional processing station disclosed by Applicant because the conventional processing station allowed any desirable process to be carried out upon the semiconductor wafers, such as electroplating.

Regarding claim 19, it would have been obvious to one of ordinary skill in the art to have adapted the apparatus of Thompson et al to use the conventional processing stations disclosed by Applicant because the conventional processing stations allow any desirable process to be carried out upon the semiconductor wafers, such as electroplating (to enhance seed layer and to apply a blanket layer), removal of material and thermal processing.

Regarding claim 20, as above, the apparatus of Thompson et al includes a spray station as claimed. It would have been obvious to one of ordinary skill in the art to have adapted the apparatus of Thompson et al to use the conventional processing stations disclosed by Applicant because the conventional processing stations allow any

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desirable process to be carried out upon the semiconductor wafers, such as electrophoretic deposition and thermal processing.

Regarding claim 21, it would have been obvious to one of ordinary skill in the art to have adapted the apparatus of Thompson et al to use the conventional processing stations disclosed by Applicant because the conventional processing stations allow any desirable process to be carried out upon the semiconductor wafers, such as removal of material.

Regarding claims 22 and 23, the admitted prior art material removing station meets all of the claimed structural limitations. It would have been obvious to one of ordinary skill in the art to have adapted the apparatus of Thompson et al to use the conventional processing stations disclosed by Applicant because the conventional processing stations allow any desirable process to be carried out upon the semiconductor wafers, such as removal of material.

Regarding claim 24, Thompson et al teach (as above) the apparatus including a spray station as claimed.

Regarding claim 26, the apparatus of Thompson et al includes a vessel 51 for processing the wafers and a support 50 configured to hold the wafer, the support being movable between two positions in the apparatus. The wafers are automatically loaded into the support or can be manually loaded at any location. The support is capable of stopping its motion at any location.

11. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Thompson et al (US 5,168,886) in view of Hongo et al (US 6,716,330).

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The teachings of Thompson et al are described above.

Thompson et al teach (see col. 2, lines 34-42) that the processing stations are conventional in the art for processing the semiconductor wafers.

Hence, Thompson et al does not teach the details of the conventional processing stations.

However, Hongo et al teach (see abstract, figures 2 and 3) an electroless plating station for a semiconductor wafer (W) including a first vessel configured to provide a fluid and a weir (overflow dam (30)) positioned to define a level of the fluid, a second vessel (32) disposed around the first vessel to receive the fluid flowing over the weir, a support (12) positioned to carry the wafer into contact with the fluid and a reservoir (not shown, source of feed 22) configured to carry the fluid.

Therefore, it would have been obvious to one of ordinary skill in the art to have adapted the apparatus of Thompson et al to use the conventional electroless processing station of Hongo et al by Applicant because the electroless processing station forms a more uniform thickness of the plated material.

12. Claims 12, 13, 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Curtis et al (US 6,264,752).

Regarding claim 12, Curtis et al do not expressly disclose that the apparatus includes a shield around the processing stations for restricting user access to the transfer device. However, at col. 5, lines 33-55) Curtis et al describe the desirability of conducting processing in a clean room environment. Therefore, it would have been obvious to one of ordinary skill in the art to have added a shield for closing off the area

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surrounding the processing stations so that the processing stations could be operated in a clean room environment.

Regarding claim 13, the processing stations in figure 12 of Curtis et al are arranged along a generally straight line and the transfer device includes a robot configured to move along a second parallel line. Curtis et al do not expressly disclose that the apparatus includes an enclosure around the processing stations for restricting user access to the transfer device. However, at col. 5, lines 33-55) Curtis et al describe the desirability of conducting processing in a clean room environment. Therefore, it would have been obvious to one of ordinary skill in the art to have added an enclosure for closing off the area surrounding the processing stations so that the processing stations could be operated in a clean room environment. Since the robot transfer device would need access to the input/output station, the enclosure would have an aperture accessible to the robot. Since Curtis et al teach that each of the stations is manually accessible, it would have been desirable to have added a second closable aperture to provide manual access to the processing stations.

Regarding claims 16 and 17, it would have been obvious to one of ordinary skill in the art to have added an enclosure to the apparatus of Curtis et al in figure 12 to provide processing in a clean room environment. Since Curtis et al teach that each of the stations is manually accessible, it would have been desirable to have added a two closable apertures to provide manual access to the processing stations on either side of the center linear path 630. The third and fourth sides would have no apertures for manual access.

13. Claims 2-5, 7, 9-11, 21-23, 25 and 27-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Curtis et al (US 6,264,752) in view of Applicant's admission of prior art.

The teachings of Curtis et al are described above (all references to paragraph numbers in the present application come from the PGPub of this application, 2003/0159921).

Curtis et al teach (see col. 10, lines 10-24) that the processing stations other than the disclosed reactor are conventional in the art for applying complementary processing steps on the microelectronic workpieces.

Hence, Curtis et al does not teach the details of the conventional processing stations.

However, Applicant admits as prior art (see paragraphs 81, 89, 96, 105, 110, 121 and 134) that certain aspects of the processing stations were known in the prior art from various disclosed references. This subject matter corresponds to the inventions shown in Figures 9, 12-14, 16 and 18. Each of these conventional processing stations corresponds to claims 2-5, 7 and 9-11.

Therefore, it would have been obvious to one of ordinary skill in the art to have adapted the apparatus of Curtis et al to use the conventional processing stations disclosed by Applicant because the conventional processing stations allow any desirable process to be carried out upon the semiconductor wafers, such as electroplating, removal of material, metrology (testing of certain properties) and thermal processing.

Regarding claim 21, it would have been obvious to one of ordinary skill in the art to have adapted the apparatus of Curtis et al to use the conventional processing stations disclosed by Applicant because the conventional processing stations allow any desirable process to be carried out upon the semiconductor wafers, such as removal of material.

Regarding claims 22 and 23, the admitted prior art material removing station meets all of the claimed structural limitations. It would have been obvious to one of ordinary skill in the art to have adapted the apparatus of Curtis et al to use the conventional processing stations disclosed by Applicant because the conventional processing stations allow any desirable process to be carried out upon the semiconductor wafers, such as removal of material.

Regarding claim 25, the processing stations in figure 12 of Curtis et al are arranged along a generally straight line and the transfer device includes a robot configured to move along a second parallel line. Curtis et al do not expressly disclose that the apparatus includes an enclosure around the processing stations for restricting user access to the transfer device. However, at col. 5, lines 33-55) Curtis et al describe the desirability of conducting processing in a clean room environment. Therefore, it would have been obvious to one of ordinary skill in the art to have added an enclosure for closing off the area surrounding the processing stations so that the processing stations could be operated in a clean room environment. Since the robot transfer device would need access to the input/output station, the enclosure would have an aperture accessible to the robot. Since Curtis et al teach that each of the stations is

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manually accessible, it would have been desirable to have added a second closable aperture to provide manual access to the processing stations. . .

Regarding claim 27, it would have been obvious to one of ordinary skill in the art to have added an enclosure to the apparatus of Curtis et al in figure 12 to provide processing in a clean room environment. Since Curtis et al teach that each of the stations is manually accessible, it would have been desirable to have added a two closable apertures to provide manual access to the processing stations on either side of the center linear path 630.

Regarding claim 28, Curtis et al teach a plurality of processing stations arranged along a generally linear single axis, and, as above, all of the stations being manually accessible, an input/output station and a robotic transfer device. Thus, Curtis et al fail to teach that one of the stations was a thermal processing station with a thermal processing space further including a heat transfer unit at least proximate to the thermal processing space. However, Applicant admits as prior art (see paragraph 134) that such a thermal processing unit was known in the prior art. Therefore, it would have been obvious to one of ordinary skill in the art to have adapted the apparatus of Curtis et al to use the conventional processing station disclosed by Applicant because the conventional processing station allows any desirable process to be carried out upon the semiconductor wafers, such as thermal processing.

Regarding claims 29 and 30, as mentioned above, the details of the thermal processing station were admitted by Applicant to be prior art (see paragraph 134). Therefore, the prior art meets the claimed structural limitations.

Regarding claim 31, it would have been obvious to one of ordinary skill in the art to have added an enclosure to the apparatus of Curtis et al in figure 12 to provide processing in a clean room environment. Since Curtis et al teach that each of the stations is manually accessible, it would have been desirable to have added a two closable apertures to provide manual access to the processing stations on either side of the center linear path 630.

Regarding claim 32, it would have been obvious to one of ordinary skill in the art to have added an enclosure to the apparatus of Curtis et al in figure 12 to provide processing in a clean room environment. Since Curtis et al teach that each of the stations is manually accessible, it would have been desirable to have added a two closable apertures to provide manual access to the processing stations on either side of the center linear path 630.

14. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Curtis et al (US 6,264,752) in view of Hongo et al (US 6,716,330).

The teachings of Curtis et al are described above.

Curtis et al teach (see col. 10, lines 10-24) that the processing stations other than the disclosed reactor are conventional in the art for applying complementary processing steps on the microelectronic workpieces.

Hence, Curtis et al does not teach the details of the conventional processing stations being an electroless plating station.

However, Hongo et al teach (see abstract, figures 2 and 3) an electroless plating station for a semiconductor wafer (W) including a first vessel configured to provide a

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fluid and a weir (overflow dam (30)) positioned to define a level of the fluid, a second vessel (32) disposed around the first vessel to receive the fluid flowing over the weir, a support (12) positioned to carry the wafer into contact with the fluid and a reservoir (not shown, source of feed 22) configured to carry the fluid.


Therefore, it would have been obvious to one of ordinary skill in the art to have adapted the apparatus of Curtis et al to use the conventional electroless processing station of Hongo et al by Applicant because the electroless processing station forms a more uniform thickness of the plated material.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Harry D Wilkins, III whose telephone number is 571-272-1251. The examiner can normally be reached on M-Th 10am-8:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy V King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Harry D Wilkins, III
Examiner
Art Unit 1742

hdw


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